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## Water Soluble Salt Cores for Die Casting

## 5 Specification

The present invention relates to water soluble salt cores for die casting having the features of the preamble of claim 1.

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Such salt cores for casting purposes that are flushed out of parts after casting as well as attempts at optimizing them by admixing additives have been long known. In DE-C-14 83 641 it has been found that adding up to 10 % of borax, magnesium oxide or talcum improves the load capacity of salt cores consisting of NaCl and/or KCl. DE-A-19 34 787 proposes to  
15 add a synthetic resin binder and water glass in order to avoid pressing and sintering. These admixtures are also known from US-A-37 64 575. In the past, such salt cores have been utilized in permanent mold casting. These salt cores did not resist pressure casting. In pressure casting, sand cores have been utilized for years instead, said sand cores being made for their major part with binders containing phenol and furan. Since this technology relies on  
20 processing environmentally harmful substances, it is judged critical and requires highly cost-intensive protection measures. Therefore, there is a need for environmentally friendly cores relying e.g., on salt for pressure casting.

It is the object of the present invention to provide a method of manufacturing a salt core for  
25 pressure casting yielding salt cores meeting the demands of pressure casting and being made from constituents that do not contain any environmentally harmful components.

This object is solved with the features recited in claim 1.

30 In accordance with the invention, water soluble salt cores for pressure casting that are manufactured compacting a mixture of water soluble salts under pressure and are subsequently sintered, said mixture having, for 100 parts by weight of salt, between 4 and 5 parts by weight of borax, between 2 and 3 parts by weight of magnesium and from 0.5 to 2 parts by weight of graphite or talcum, characterized in that compaction occurs at a pressure of

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between 300 and 900 N/mm<sup>2</sup>. It has been found, surprisingly, that, under the very high compression pressure, such an actually known mixture develops properties making it suitable for pressure casting. The compressed salt cores are sintered at 650 – 730 °C for between half an hour and 2 hours.

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A method of the invention for manufacturing water soluble salt cores is characterized by the following steps:

- preparing a mixture of 100 parts by weight of salt, between 4 and 5 parts by weight of borax, between 2 and 3 parts by weight of magnesium and 0.5 to 2 parts by weight of graphite or talcum,
- compacting the mixture in a press at a pressure ranging between 300 and 900 N/mm<sup>2</sup>
- sintering the compressed salt cores at 650 – 730 °C for between half an hour and 2 hours.

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The invention will be illustrated in greater detail herein after by way of example only with reference to formulations.

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#### *Mixture I*

100 kg of salt

20 4.6 kg of borax

2.6 kg of magnesium

1.7 kg of graphite

This mixture is subjected to a compression pressure of 600 N/mm<sup>2</sup> and sintered at 700 °C. The salt core is suited for pressure casting.

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#### *Mixture II*

100 kg of salt

4.6 kg of borax

30 2.6 kg of magnesium

0.8 kg of talcum

This mixture is subjected to a compression pressure of 700 N/mm<sup>2</sup> and sintered at 720 °C. The salt core is suited for pressure casting.

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